



AN OVERVIEW ON URBAN AND PERI URBAN AGRICULTURE: PRODUCTION TO FOOD SYSTEM

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ABSTRACT

Urban and peri-urban agriculture may be crucial as sources of fresh, locally grown food. Our premise is that peri-urban and urban agriculture are different, and that this has significant implications for food security and other issues, yet some experts do not distinguish between the two, viewing them as one and the same. Food insecurity has resulted from the growth of urban slums in major cities worldwide as a result of rural exodus and rising urbanization. As starvation and malnutrition wreak havoc in areas of the developing world, made worse by never-ending conflicts, food deserts and food pantries are emerging in the affluent world. In order to achieve this, thorough literature research was carried out, which led to the identification and comparison of their socioeconomic, ecological, and spatial features. The findings' implications for food security are examined in light of the four tiers of the food system—production, processing, distribution, and consumption. The findings demonstrate that, in the Global North, urban and peri-urban agriculture indeed differ in the majority of their features, and as a result, so does their capacity to supply urban residents with food. These strains have affected soil quality as well as land use, which has decreased the amount and quality of food that the urban poor can afford. In addition to lowering carbon emissions and improving urban environmental quality, food gardens are valuable hubs for networking, empowerment, and community connection.

Keywords: *peri-urban agriculture, cropping, socio-economic, urban poor, food system, urban inhabitants, soil quality.*

INTRODUCTION

The term "urban agriculture" describes farming methods used in urban and peri-urban regions. Between the outskirts of metropolitan and regional centers and the rural environment, peri-urban areas are those that shift from rural land uses (like agricultural or animal production) to urban ones (like the built environment, manufacturing, services, and utilities). Urban agricultural operations, which include commercial-scale floriculture, aquaculture, beekeeping, and animal husbandry, are aimed at producing a variety of food and non-food items. However, because of the complexity (soil management, irrigation, transplantation, mechanization, and harvesting) and the large amount of land needed, it is unlikely that the cultivation of staple foods will be included in the range of agricultural activities attempted under urban agriculture. Fruits, vegetables, dark leafy greens, seafood, and legumes are among the foods that can be grown using urban agriculture because they are high in micronutrients. Food security, urbanization, and climate change are all interconnected problems. Healthy foods produced by urban agriculture support food and nutrition security. It supports environmental sustainability, community economic development, and the social and cultural fabric of local communities. These substances support the growth, development, and upkeep of the human organism and are required in trace amounts. Urban agriculture encompasses a range of livelihood patterns, ranging from household-level subsistence farming to highly marketed agriculture. "Development" describes the unique state of affairs and the transformation it brings about. Economic progress was regarded as a sign of development throughout human history, and economic notions were used to quantify

development. It is not always the case that advancements that benefit people also benefit the environment. One of its primary characteristics is its adaptability to a variety of urban settings and stakeholder needs.

LITERATURE REVIEW

Kumar Srinivasan (2023) Urban and peri-urban farming (UPF) research has grown significantly in recent years, although there is not a thorough worldwide review. Using an integrated literature review technique that included bibliometric analysis, thematic assessment, and a systematic literature review, this study looked at UPF research conducted between 2002 and 2022. Urban agriculture, food security, local food systems, community gardens, and sustainable agriculture were found to be important terms in the literature when 1,257 articles from the Web of Science database were analyzed using Vosviewer and Bibliometrix. The Internet of Things (IoT), resilience, plant factories, life cycle assessment (LCA), vertical farming, and controlled environment agriculture (CEA) were among the most prominent scientific trends. In the UPF research network, co-authorship partnerships from China, India, and Brazil were noted, and publications by authors with US affiliations garnered more citations.

Junuthula Shirisha (2022) To find out the urban gardening methods used by urbanites in various parts of Hyderabad, an exploratory study was carried out. The study sample consisted of one hundred active urban farming practitioners, and responses were gathered utilizing a semi-structured interview schedule. After decoding and statistical analysis, the data was logically interpreted. According to the findings, the majority of respondents (44.0%) were cultivating two to four different kinds of food, such as fish, mushrooms, and vegetables. Of them, 45.0% grew at least one to five different kinds of fruits and vegetables. According to the interviewees, "own interest" was the primary motivation for engaging in urban farming (81.0%). The respondents cited a variety of sources of inspiration for adopting urban farming practices, including "personal curiosity," information from "newspapers," and, in that order, from friends and family.

Ankit Kumar Singh (2021) The Yang Laboratory at the University of Connecticut has created the so-called GREENBOX technology, which enables crop growth in individual climate-controlled boxes in urban warehouse environments and other enclosed structures, in response to the strain that urbanization and the growing global population are placing on food security. A GREENBOX unit is a modular, thermally insulated building that has full environmental controls, a soilless (hydroponic) growing platform, and LED artificial lighting. At different scales, a big production system can incorporate multiple GREENBOX units. Through an analysis of productivity and environmental factors, this study assessed the GREENBOX technology's suitability for usage in urban warehouse settings. For reference, we simultaneously carried greenhouse growth. In an experimental greenhouse and two protocol GREENBOX units in the high ceiling headhouse of the experimental greenhouse in Storrs, Connecticut, we grew Butterhead Rex lettuce (*Lactuca sativa*) over 30-day growing cycles in the summer and winter.

Sana A.A. Abusin (2020) A nation's ability to attain and sustain food security is impacted by biophysical elements, socioeconomic factors, and political upheavals that impede food production and impact food access. Commercial food production in unconventional food

production settings has been growing over the last few decades. The advantages that aquaponics systems offer over conventional agricultural systems are increasingly becoming clear. However, aquaponics' capacity to combine hydroponics with aquaculture to create wholesome food has drawn increased interest due to its sustainability and economic feasibility. In this essay, we discuss the potential benefits of aquaponics for dry nations, with an emphasis on the State of Qatar.

S.Bindu Madhuri (2015) Rapid shifts in land use and significant variety are characteristics of peri-urban settings. Additionally, as peri-urban areas provide appealing residential choices to city centers or more rural locations, the demographic composition shifts. Peri-urban areas, which are neither city nor countryside and serve a variety of purposes from residential and recreational spaces to agricultural production, are left in an intermediate state by the dynamic processes. Using quantitative data gathered on agricultural properties in four study regions between 1990 and 2012, this research examines the urbanization of agricultural areas in the Greater Hyderabad region. The general conclusion is that urbanization processes have consistently had little impact on the usage of agricultural land. However, a few number of very big full-time farms account for the majority of production. Furthermore, there has been a significant diversification of economic activity.

Urban Agriculture and Technology

Even though cities only make up around 3% of the world's land area, urban agriculture seems to have a lot of promise for food production. Even though urban areas are relatively small, one study found that, if fully implemented in cities worldwide, urban agriculture could produce an annual yield of about 180 million metric tons of food, or about 10 percent of the global output of legumes, roots and tubers, and vegetable crops. This study used the Google Earth Engine software along with population, meteorological, and other relevant data. This production capacity can be increased with additional innovation as well as technical and governmental assistance.

Nutrition and quality of food

Consuming a range of fruits and vegetables on a daily basis is associated with a lower chance of developing chronic illnesses like diabetes, heart disease, and cancer. Increased fruit and vegetable intake is linked to urban agriculture, which lowers disease risk and can be an affordable means of supplying residents with high-quality, fresh produce in urban areas. Urban garden vegetables may be more palatable and appealing than store-bought produce, which could increase its acceptance and consumption. According to a research conducted in Flint, Michigan, community gardeners were 3.5 times more likely to eat fruits and vegetables at least five times a day and consumed them 1.4 times more frequently overall. Children can also benefit nutritionally from garden-based schooling. According to a research conducted in Idaho, sixth graders who participated in school gardens consumed more fruit, vegetables, fiber, vitamin A, and vitamin C. The enzymatic process of nutritional breakdown, which is particularly harmful to water-soluble vitamins like thiamin and ascorbic acid, is started when fruits and vegetables are harvested.

Environmental justice

For communities residing in food deserts, urban agriculture may promote both environmental and food justice. First, race and class differences in access to nutritious food may be lessened

via urban agriculture. Greater fairness between rich and poor neighborhoods results when urban agriculture produces locally grown fresh produce that is sold at reasonable costs in food deserts, extending access to nutritious food beyond those who reside in affluent regions. Urban agriculture's increased food availability might also lessen the psychological strain on underprivileged communities. Through urban gardening, community members increase local awareness of nutritious ways to meet dietary demands. Additionally, urban agriculture can improve community members' mental health. Community members can assist one another by purchasing and selling high-quality goods to nearby producers and customers, which may lessen stress. Urban agriculture can therefore contribute to bettering the situation in underprivileged areas, where people feel more stressed because they do not feel like they have any control over their lives.

The conditions shaping urban food systems

Globalized food supply systems have become increasingly intertwined with urban living and eating. Processed foods, long-distance food transportation, and supermarkets as significant food outlets for home consumption are on the rise, especially in industrialized economies but also in many developing economies. The urban population has benefited greatly from this globalized food system in many ways, including year-round availability of various food goods and generally continual access to food at affordable costs. But these advantages have also come with a number of expenses that are making it difficult to carry on with business as normal. These expenses inherent in the worldwide industrial food system, along with a number of contemporary trends and dynamics that affect food provisioning activities, determine the circumstances for urban food systems both now and in the future. These trends, dynamics, and costs will be presented and discussed below.

Guiding principles for resilient urban food systems

Building resilient urban food systems is a huge task because of the diversity and complexity of the factors influencing present and future urban food systems, as well as the interdependence of these factors. In other words, because "there is the potential of unintended repercussions in single solutions," these situations "cannot be treated singularly, but must be addressed holistically and collectively." Therefore, instead of offering solutions, I will stick to a set of guidelines for creating resilient urban food systems that serve as stepping stones for dealing with the aforementioned issues in a more thorough manner.

Municipal policies and programmes regarding the urban food system

An outline of municipal policies and programs pertaining to the urban (or city-region) food system, whether planned or ongoing, is given below. We organized these policies according to the four primary goals listed above. Certain policies are addressed more than once since they may be utilized to achieve various goals. In these situations, we only give information about the policy once. We provide one or more examples for each identified policy to show how different cities' implementations of a certain food policy vary. It was simple to discover numerous instances for a number of policies (such as the establishment of farmers markets, preferential food procurement, community gardening support, or school food programs), but we only included a handful. It was more challenging to locate instances of towns implementing other policies (such as those that sought to improve the urban poor's access to

food by controlling food costs, increasing minimum wages, or providing employment or income possibilities for low-income or disadvantaged households).

RESEARCH METHODOLOGY

The urban farming techniques of active urban practitioners from Hyderabad, Telangana State, were the main subject of this study. The methods of observation, surveys, in-depth interviews, and questionnaires are used to gather the primary data. The secondary data was extracted from a variety of online sources, government websites, and published and unpublished literature, including the Hyderabad City Development Census. During the survey, information was gathered on the kinds and quantity of food produced, the area used for urban farming, the motivations and sources for practicing urban farming, the models employed, the length of time spent practicing urban farming, the kinds of containers used, and the challenges they experienced. Questionnaires and in-depth interviews were the primary methods used to gather primary data from the original source. One important institution in the city is the Indian Institute of Petroleum. This town is characterized by the rapid growth of built-up regions at the expense of agricultural and forest territory. For the town's general development, an efficient land-use plan is therefore necessary. Both qualitative and quantitative methods were used in the analysis of the survey results. Both descriptive and inferential statistics were used in the methods used to examine the data for this study. Using descriptive statistics, such as mean, percentage, and standard deviation (SD), the data was statistically examined and logically given in depth under the results and discussion part.

RESULTS AND DISCUSSIONS

The respondents' primary urban farming practices include the following: the kinds of food produced, the total quantity of fruits and vegetables produced, the cultivation area, the motivations behind urban farming, the training programs they attended, the models and containers they used, and the length of time they practiced. As seen in Table 1, the respondents were cultivating a variety of things, including fruits, vegetables, fish, mushrooms, and more. As a result, they were divided into various groups according to the quantity of various foods they grew. According to how many foods they grew, the respondents were divided into three groups: up to two, three to four, and more over four.

Table 1: Types of food grown by the respondents through urban farming

Type of foods grown	Number of respondents (f)	Percentage (%)
Upto 2	41	41.0
3-4	43	43.0
>4	4	4.0
Total	100	100.0

Just 4.0% of them were growing more than four different food groups, while the majority (44.0%) were growing three to four food groups made up of fruits and vegetables. Another 41.0% of them were growing up to two food groups, such as fruits, vegetables, mushrooms, etc.

They grew papayas, lemons, sweet limes, plums, and other fruits in their home garden. Table 2 provides information on the quantity of fruits and vegetables that the respondents grew.

Table 2: Total number of fruits and vegetables grown by the respondents through urban farming

No. of foods grown	Number of respondents (f)	Percentage (%)
1-5	45	45.0
5-10	40	40.0
Above 10	15	15.0
Total	100	100.0

One of the main benefits of urban farming was that it made fresh, green vegetables more accessible. According to the findings, the majority of respondents (45.0%) grew at least one to five different kinds of fruits and vegetables in their home garden. These were followed by 40.0 percent who grew five to ten different kinds and 15.0 percent who grew more than ten different kinds.

Table 3: Area utilization under urban farming practice by the respondents

Area (sqft)	Vegetables (n=100)		Fruits (n=28)	
< 500	31	31.0	21	75.0
500-1000	35	35.0	6	21.4
>1000	34	34.0	1	3.6
Total	100	100.0	28	100.0

Other reasons they gave included their nativity as members of an agricultural family, which sparked their interest in urban farming, their passion for organic farming, the desire to obtain government subsidies, the inspiration of other members who were engaged in the practice, the desire to restore biodiversity, and their perception of newspaper articles as helpful sources of information that inspired and educated them in varying percentages ranging from 8 to 1.

CONCLUSION

Local development laws, planning design, and space are some of the limitations that urban agriculture must deal with. In metropolitan areas, activities like indoor food production, urban farming, and community gardening have grown in popularity and are regularly cited for their advantages for urban communities. Healthy meals are more prevalent in urban areas because to urban agriculture, but this does not always mean that those foods are available to those who need them the most. However, each of these can be addressed by implementing a variety of technologies, establishing peri-urban urban agricultural projects, initiating community projects in public settings, and changing local ordinances and planning guidelines to incorporate urban agriculture as a ULB activity. In a broader sense, urban farming can help ensure the food and nutritional security of urban and periurban residents, especially during times of crisis like the present epidemic. In order to combat food insecurity, urban farming ought to be promoted in all densely populated urban and peri-urban regions. In addition to promoting economic and community development, providing special opportunities for young people, and providing employment training for those who are interested, urban agricultural initiatives enhance the social and cultural diversity of communities.

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